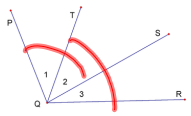
Warm-up!

Given: $m\angle PQS = m\angle TQR$

Prove: $m\angle 1 = m\angle 3$



Statements	Reasons
① $m\angle PQS = m\angle TQR$	① Given
② $m\angle 1 + m\angle 2 = m\angle PQS$ $m\angle 2 + m\angle 3 = m\angle TQR$	② Add
③ $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	③ Subst.
④ $m\angle 2 = m\angle 2$	④ Ref
⑤ $m\angle 1 = m\angle 3$	⑤ Subtr

2.7 Prove Angle Pair Relationships

Theorem 2.3--All right angles are congruent

Theorem 2.4-The Congruent Supplements Theorem--

If 2 ∠s are supplementary to the same ∠ (or ≅ ∠s) then they are ≅.

Theorem 2.5-The Congruent Complements Theorem--

If 2 ∠s are complementary to the same ∠ (or ≅ ∠s) then they are ≅.

Prove Theorem 2.4

Given: ∠1 and ∠2 are supplementary

∠3 and ∠2 are supplementary

Prove: ∠1 ≅ ∠3

S	R
① ∠1 + ∠2 suppl & ∠3 + ∠2 are suppl	① Given
② $m\angle 1 + m\angle 2 = 180$ $m\angle 3 + m\angle 2 = 180$	② def of suppl.
③ $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	③ Subst.
④ $m\angle 2 = m\angle 2$	④ Ref
⑤ $m\angle 1 = m\angle 3$	⑤ Subtr.
⑥ $\angle 1 \cong \angle 3$	⑥ def of ≅

Postulate 12—The Linear Pair Postulate

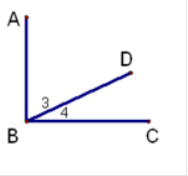
If 2 ∠s form a Linear Pair, then they are supplementary.

The Complement Theorem—If the noncommon sides of 2 adjacent angles form a right angle, then the angles are complementary angles. (not in book)

Theorem 2.6—Vertical angles are congruent

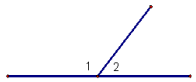
Given: $\overline{AB} \perp \overline{BC}$

1. ∠ABC is a right angle	1. Def of ⊥ lines
2. ∠3 and ∠4 are complementary	2. The Complement Thm.



How they are used:

Given: picture

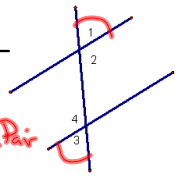


1. ∠1 and ∠2 are a linear pair.	1. Definition of a linear pair
2. ∠1 and ∠2 are supplementary	2. The Linear Pair Postulate (LPP)
3. m∠1 + m∠2 = 180	3. Def. of supplementary

Given: ∠1 ≅ ∠3

Prove: ∠2 ≅ ∠4

Statements	Reasons
1. ∠1 ≅ ∠3	1. Given
2. ∠1 + ∠2 are a Ln Pair ∠3 + ∠4 are a Ln Pair	2. def of Ln Pair
3. ∠1 + ∠2 are suppl. ∠3 + ∠4 are suppl.	3. L.P.P.
4. ∠2 ≅ ∠4	4. ≅ Suppl. thm



Given: ∠1 and ∠2 are supplementary **Conclusion:** m∠1 + m∠2 = 180
Reason: Definition of supplementary angles

Given: ∠1 and ∠2 are complementary **Conclusion:** m∠1 + m∠2 = 90
Reason: Definition of complementary angles

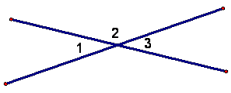
Given: ∠1 is a right angle **Conclusion:** m∠1 = 90
Reason: Definition of right angles

Given: $\overline{AB} \perp \overline{BC}$ **Conclusion**: ∠ABC is a right angle
Reason: Definition of perpendicular lines

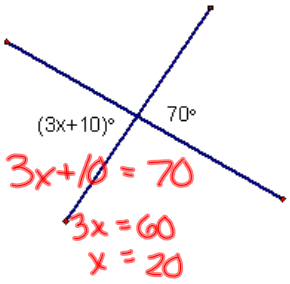
Proof of theorem 2.6:

Given: picture

Prove: ∠1 ≅ ∠3



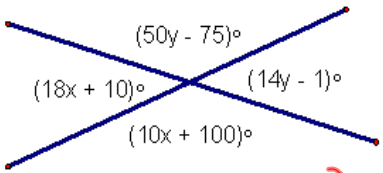
Statements	Reasons
① ∠1 + ∠2 are a Ln Pair ∠2 + ∠3 are a Ln Pair	① def of L.P.
② ∠1 + ∠2 are suppl ∠2 + ∠3 are suppl	② L.P.P.
③ ∠1 ≅ ∠3	③ ≅ Suppl thm



$3x + 10 = 70$

$3x = 60$

$x = 20$



$18x + 10 + 10x + 100 = 180$

$28x = 70$

$x = 2.5$

$50y - 75 + 14y - 1 = 180$

$64y = 256$

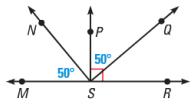
$y = 4$

HW
p127-130
3, 4, 9, 12, 17-19, 28, 38, 43

~~HW~~
~~p127-130~~
~~3, 4, 9, 11-14, 17-21, 28, 29, 38, 43~~

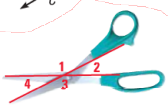
IDENTIFY ANGLES Identify the pair(s) of congruent angles in the figures below. *Explain* how you know they are congruent.

3.



4. $\angle ABC$ is supplementary to $\angle CBD$. $\angle CBD$ is supplementary to $\angle DEF$.

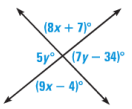
9. If $m\angle 3 = 168°$, find $m\angle 1$, $m\angle 2$, and $m\angle 4$.



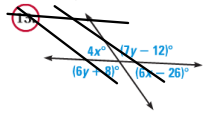
~~11. If $m\angle 2 = 62°$, find $m\angle 1$, $m\angle 3$, and $m\angle 4$.~~

ALGEBRA Find the values of x and y.

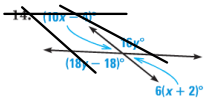
12.



13.

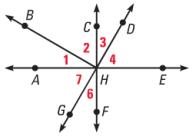


~~14.~~



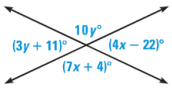
FINDING ANGLE MEASURES In Exercises 17–21, copy and complete the statement given that $m\angle FHE = m\angle BHG = m\angle AHF = 90°$.

17. If $m\angle 3 = 30°$, then $m\angle 6 =$?.
18. If $m\angle BHF = 115°$, then $m\angle 3 =$?.
19. If $m\angle 6 = 27°$, then $m\angle 1 =$?.
~~20. If $m\angle DHF = 133°$, then $m\angle CHG =$?.~~
~~21. If $m\angle 3 = 32°$, then $m\angle 2 =$?.~~

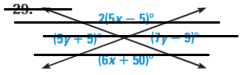


ALGEBRA Find the measure of each angle in the diagram.

28.

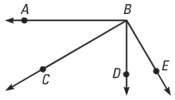


~~29.~~



PROOF Use the given information and the diagram to prove the statement.

38. **GIVEN** ▶ $\angle ABD$ is a right angle. $\angle CBE$ is a right angle.
PROVE ▶ $\angle ABC \cong \angle DBE$



43. **GIVEN** ▶ $\angle QRS$ and $\angle PSR$ are supplementary.
PROVE ▶ $\angle QRL \cong \angle PSR$